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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/655,236 | 09/03/2003 | Ruolin Li | 42P16213X | 5717 |

7590 10/05/2004
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| EXAMINER |
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KALIVODA, CHRISTOPHER M

| ART UNIT | PAPER NUMBER |
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2883

DATE MAILED: 10/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/655,236

Applicant(s)

LI, RUOLIN

Examiner

Christopher M. Kalivoda

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☒ Claim(s) 4, 13 and 26 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: Reference signs 101, 105, 110, 115 and 120 mentioned in paragraph 0004 and reference sign 505 in mentioned paragraph 0024. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claims 4, 13 and 26 are objected to because of the following informalities:
Regarding claim 4, line 1, there is a missing word "a" after the word "comprising".
Regarding claim 13, line 3, the word "independently" should be "independent".
Regarding claim 26, line 2, there appears to be a typographical error. The first word "polymer" is believed to be "cladding". Please see claim 7. Appropriate correction is required.

Double Patenting

3. Claims 1-30 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-30 of copending Application No. 10/425,279 as amended. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-4, 8, 16, 17, 24, 25 and 27-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Henry et al., U.S. Patent 6,137,939.

Regarding independent claim 1, Henry et al. teach an apparatus comprising a wave guide clad comprising a first material (col 4, line 8-10 and Fig 1b, ref sign 16 where the first material is silica) whose refraction index varies by a first magnitude according to a temperature variation of the first material and a second material (col 6, lines 55-57 and Fig 1b, ref sign 20 where the second material is an elastomer) whose refraction index varies by a second magnitude according to a temperature variation of the second material, the second magnitude being inversely related to the first magnitude (col 4, lines 60-64) and a wave guide core (col 6, lines 55-57 and Fig 1b, ref sign 14) within the wave guide clad.

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Regarding independent claims 8 and 16, Henry et al. teach an apparatus comprising two materials (a first material, col 4, line 8-10 and Fig 1b, ref sign 16 is silica and the second material, col 6, lines 55-57 and Fig 1b, ref sign 20 is an elastomer) each having a refraction index to change in opposite magnitude in relation to the other in response to variations in temperature of the waveguide (col 4, lines 60-64).

While the reference does not specifically state stabilizing a light's wavelength as in claim 8 or stabilizing a light's phase as in claim 16, the structure as claimed is present in Henry et al. and the device is thus capable of stabilizing a light's wavelength or phase since it is independent of temperature (col 4, lines 17-20) (See *In re Swinehart*, 169 USPQ 226 (CCPA 1971); *In re Schreiber*, 44 USPQ2d 1429 (Fed. Cir. 1997).

Regarding independent claim 24, Henry et al. teach a system comprising a light source to emit a spectrum of light wavelengths (col 1, lines 26-30); a wave guide to guide light from the light source having a first wavelength (Fig 5a, ref sign 130), the wave guide comprising a clad material (col 4, line 8-10 and Fig 1b, ref sign 16), the wave guide including a polymer to help maintain an effective wave guide refraction index within an optical mode of the waveguide (col 6, lines 55-57 and Fig 1b, ref sign 20 where an elastomer is a type of polymer) that is independent of temperature changes in the wave guide (col 4, lines 17-20).

The limitations of Henry et al. clearly fully meet applicant's claimed limitations in the above independent claims.

Regarding claims 2 and 25, the first magnitude contributes to an increase in the refraction index of the first material in response to the temperature variation and the

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second magnitude contributes to a decrease in the refraction index of the second material in response to the temperature variation since silica has a positive dn/dT (col 4, lines 29-31) and the elastomer moves in the opposite direction (col 4, lines 60-64).

Regarding claim 3, there is a source for producing light (col 1, lines 26-30).

Regarding claims 4 and 29, there can also be a grating (col 7, lines 59-61) since Bragg-filters are also contemplated.

Regarding claim 17, one of the two materials is a polymer (col 6, lines 55-57 and Fig 1b, ref sign 20 where an elastomer is a type of polymer) distributed in segments along the length of the wave guide core within the wave guide (Fig 5a, ref sign 20).

Regarding claims 27 and 28, while the reference does not specifically state the phase of the light is substantially independent of temperature as in claim 27 or the wavelength of the light is substantially independent of temperature as in claim 28, the structure as claimed is present in Henry et al. and the device is thus capable of having the wavelength and phase independent of temperature (col 4, lines 17-20) (See *In re Swinehart*, 169 USPQ 226 (CCPA 1971); *In re Schreiber*, 44 USPQ2d 1429 (Fed. Cir. 1997)).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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7. Claims 5, 6, 2-15, 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Henry et al., U.S. Patent 6,137,939.

Regarding claim 5, Henry et al. teach the limitations of claim 1 as described above. However, the reference is silent with respect to the polymer existing within the grating area.

Henry et al. teach that Bragg filters (gratings) can benefit from the aspects of the invention (col 7, lines 59-61).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Henry et al. such that the polymer exists within the grating area for the purpose of making the grating independent of temperature as well (col 4, lines 17-20).

Regarding claim 6, Henry et al. teach the limitations of claim 1 as described above. However, the reference is silent with respect to the first and second material contributing to an effective refraction index of the wave guide clad.

The structure as claimed is present in Henry et al. and the first and second material are thus capable of contributing to an effective refraction index of the wave guide clad since the device is independent of temperature (See *In re Swinehart*, 169 USPQ 226 (CCPA 1971); *In re Schreiber*, 44 USPQ2d 1429 (Fed. Cir. 1997)).

Regarding claims 12 and 13, while the reference does not state a second means for stabilizing the phase of light across varying temperatures of the waveguide wherein the means comprises the two materials in proportionate amounts so as to make a round trip refraction distance of a photon of the light substantially independent of temperature,

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the structure as claimed is present in Henry et al., and the device is thus capable of making a round trip refraction distance of a photon independent of temperature for the purpose of stabilizing phase (See In re Swinehart, 169 USPQ 226 (CCPA 1971); In re Schreiber, 44 USPQ2d 1429 (Fed. Cir. 1997)).

Regarding claim 14, one of the two materials is a polymer (col 6, lines 55-57 and Fig 1b, ref sign 20 where an elastomer is a type of polymer).

Regarding claims 15 and 18, while the reference is silent with respect to the effective index for the waveguide being dependent upon the product of length of a polymer segment and refraction index of the polymer, the reference does teach that the refraction index varies on the relative amounts (col 4, lines 64-67 and col 5, lines 13-18) and more polymer should be used in the longer waveguides (longer lengths). The structure as claimed is present in Henry et al. and the effective refraction index thus depends on the product of the length of the polymer segment and the refraction index of the polymer (See In re Swinehart, 169 USPQ 226 (CCPA 1971); In re Schreiber, 44 USPQ2d 1429 (Fed. Cir. 1997)).

Regarding claim 19, the effective index of refraction is substantially constant since the structure as claimed is present in Henry et al.

Regarding claims 20 and 21, the light source can be external to the waveguide (col 1, lines 26-30) since the light is launched into a separate/distinct input ports.

8. Claims 7, 9 –11 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Henry et al., U.S. Patent 6,137,939 in view of Deacon, U.S. Patent

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6,243,517. Regarding claims 7, 9 and 26, Henry et al. teach the limitations as described above. However, the reference is silent with respect to the refraction index of the wave guide clad depending on the relative amounts of the first and second materials within the optical mode of the wave guide clad. Henry et al. do teach the refraction index varies on the relative amounts (col 4, lines 64-67 and col 5, lines 13-18) and more polymer should be used in the longer waveguides.

Deacon teaches that clads with polymers have large mode overlaps (col 7, lines 34-37).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Henry et al. and modify the relative amounts of the two materials within the optical mode for the purpose of tuning (col 7, lines 32-34) wide ranges.

Regarding claim 10, Henry et al. in view of Deacon teach the limitations of claim 9 as described above. In addition, the one of the two materials is a polymer (Henry, et al., col 6, lines 55-57 and Fig 1b, ref sign 20 where an elastomer is a type of polymer).

Regarding claim 11, Henry et al. in view of Deacon teach the limitations of claim 10 as described above. However, the reference is silent with respect to the polymer existing at opposite ends of a grating within the wave guide clad.

Henry et al. teach that Bragg filters (gratings) can benefit from the aspects of the invention (col 7, lines 59-61).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Henry et al. such that the polymer exists

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on opposite ends of a grating within the waveguide clad for the purpose of making the grating independent of temperature as well (Henry et al., col 4, lines 17-20).

9. Claims 22-23 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Henry et al., U.S. Patent 6,137,939 in view of Deacon, U.S. Patent 6,243,517 and further in view of Tanaka et al., U.S. Patent 6,320,888.

Regarding claims 22 and 30, Henry et al. in view of Deacon teach the limitations as described above. However, the reference is silent with respect to the light source being a semiconductor optical amplifier (SOA) chip.

Tanaka et al, describes a frequency stabilized laser using a SOA chip (col 12, lines 10-17).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Henry et al. in view of Deacon to include a light source which is a semiconductor optical amplifier (SOA) chip for the purpose of amplifying multiplexed light (col 12, line 16).

Regarding claim 23, while the references are silent with respect to the wavelength corresponding to the max power within the emission spectrum, the structure as claimed is present as described above and the device is thus capable of having the wavelength correspond to the maximum power within the emission spectrum of the SOA. (See *In re Swinehart*, 169 USPQ 226 (CCPA 1971); *In re Schreiber*, 44 USPQ2d 1429 (Fed. Cir. 1997).

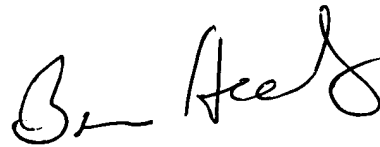
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Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Kalivoda whose telephone number is (571) 272-2476. The examiner can normally be reached on Monday - Friday (8:30 - 5:00). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


cmk


Brian Healy
Primary Examiner